

REMARKS

In the Official Action, the Examiner withdrew all the previous rejections and set forth a single rejection under 35 U.S.C. §103(a) over the combination of Lepage, U.S. Patent No. 5,824,765, and Harada et al., U.S. Patent No. 5,686,066.

By the present Amendment, a typographical error has been corrected in the specification and claim 1 has been amended to define the invention with greater precision based on the disclosure at least in paragraph [0029] on page 12. As now recited in claim 1, one aspect of the present invention relates to a polyimide compound crosslinked with polyamine which is soluble in a solvent containing aprotic polar organic solvent, wherein said polyimide compound is obtained by dehydration and condensation of amino acid or salt thereof in the presence of polyamine and protonic acid in the solvent containing aprotic polar organic solvent and 0.05 to 10 mol% of said polyamine is used with respect to the amount of said amino acid or salt thereof, and wherein a concentration of the obtained polyimide compound in the reaction mixture is 5 to 80% by weight.

It is relevant to note that the crosslinked polyimide compound of the present invention is obtained by the dehydration and condensation of amino acid or salt thereof in the presence of polyamine and protonic acid in the solvent containing aprotic polar organic solvent, such as illustrated in the Examples, not by reacting a formed polyimide with a crosslinking agent. Furthermore, the polyamine is used in a defined amount to avoid gelling (Comparative Example 4 illustrates the effect when the amount of the polyamine is greater than that claimed). As noted in aforementioned paragraph [0029] of the specification, the language added by the present Amendment is relevant with respect to the polymerization rate and the solubility of the polyimide compound.

With the foregoing discussion and the claims of record in mind, applicants respectfully submit that the presently claimed invention is patentable over the cited prior art. Lepage relates to the preparation of polycondensates of amino acids or of polypeptide hydrolysates thereof. The process involves bulk thermal polycondensation of amino acids in a pulverulent medium in the presence of phosphoric acid, phosphorous pentoxide or polyphosphoric acid catalyst which is uniformly distributed in the pulverulent medium. To obtain a greater understanding of this technique, the Examiner's attention is directed to Example 1 beginning at column 4, line 56 wherein after an empasting procedure and evaporation of water, the material is ground using an impact disc mill and is heated as a pulverulent mixture for four hours at 200° C in order to obtain polycondensation.

It is without question that Lepage does describe the defined polyimide compound crosslinked with polyamine. By requiring a pulverulent mixture, the patent would lead away from the recitation in claim 1 that the polyimide compound is obtained by dehydration and condensation of amino acid or a salt thereof in the presence of polyamine and protonic acid in the solvent containing an aprotic polar organic solvent.

Lepage also would lead away from the specific recitation in claim 1 that the concentration of the obtained polyimide compound in the reaction mixture is 5-80% by weight. As noted above, this recited concentration is relevant to the solubility of the polyimide compound, particularly in a solvent containing aprotic polar organic solvent. In contrast, Lepage again uses a pulverulent mixture which does not involve a solvent containing an aprotic polar organic solvent. In this regard, it will be noted that in Example 3 the concentration of aspartic acid is about 86 weight percent. It is believed that by using the disclosed pulverulent mixture rather than a solvent as

recited in the claims of record, the polyimide would have a higher degree of crosslinking.

As yet a further point of distinction, Lepage does not actually seek to obtain a polyimide compound crosslinked with polyamine. The passage referred to by the Examiner in the Official Action merely mentions amino acids, such as lysine, which can be combined with aspartic acid or glutonic acid. Indeed, none of the illustrative Examples includes lysine with aspartic acid. Accordingly, Lepage would not lead those of ordinary skill in the art to the presently claimed invention.

The deficiencies of Lepage are not remedied by Harada et al. and the latter patent would actually lead those of ordinary skill in the art away from the present invention. Harada et al. relates to polyaspartic acid Zwitterionic derivatives which are used in hair-treating and cosmetic compositions. As set forth in the passage beginning at column 13, line 9, the polysuccinimide can be reacted with at least one diamine compound or amphoteric amine compound with the amount of diamine and/or amphoteric amine used being in an amount of 0.1 to ten times the number of moles of the imide ring of the polysuccinimide.

The proposed combination of Harada et al. with Lepage set forth on page 3 of the Action is inconsistent with the teachings of the respective patents and, even if some proper reason existed for combining the patents, would still not lead to the presently claimed invention. In particular, Lepage, as explained above, specifically requires the polycondensation be conducted in a pulverulent medium. In fact, **Comparative** Examples 9 and 10 starting at column 8, line 37 are distinguishable from the illustrative Examples of the patent by failing to use a pulverulent reaction mixture. Thus, the Examiner's proposed combination would be directly contrary to the requirement of Lepage to use a pulverulent mixture and would violate the

principles set forth in decisions such as *Ex Parte Hartmann*, 186 USPQ 366 (Bd. App. 1974) which hold that references cannot be properly combined if the effect would be to destroy the invention on which one of the reference patents is based.

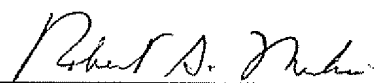
Additionally, Harada et al. describes the reaction of a formed polysuccinimide with a diamine or amphoteric amine. This is distinct from preparing the polysuccinimide itself and can be contrasted with claim 1 wherein the polyimide compound is obtained by dehydration and condensation of amino acid or a salt thereof in the presence of polyamine and protonic acid in the solvent containing the aprotic polar organic solvent. Thus, the additional reliance on Harada et al. would not lead those of ordinary skill in the art to the presently claimed invention and, if anything, would lead away from the present invention.

For all of the reasons set forth above, Applicants respectfully submit that the claims now of record are patentable over the cited prior art and therefore request reconsideration and allowance of the present application.

Should the Examiner have any questions concerning the subject application, the Examiner is invited to contact the undersigned attorney at the number provided below.

Respectfully submitted,

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